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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/816,731	04/02/2004	Henrik T. Jensen	BP 3264	1026

51472 7590 07/23/2007
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EXAMINER	
SINGH, HIRDEPAL	

ART UNIT	PAPER NUMBER
2611	

MAIL DATE	DELIVERY MODE
07/23/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/816,731	JENSEN ET AL.	
	Examiner	Art Unit	
	Hirdepal Singh	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 02 April 2004.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-21 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-21 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 02 April 2004 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

This action is in response to the original filling date of April 02, 2004. claims 1-20 are pending and have been considered below.

Specification

1. The disclosure is objected to because of the following informalities: Page 5 of the specification in line 09, Applicant used acronym "TX" without describing it in plain text. Examiner believes that it should be "transmit or transmitting" and use this assumption in the office action below.

Appropriate correction is required.

Claim Objections

2. Claims 1-20 are objected to because of the following informalities:

In Claim 1, line 5 is used an acronym "baseband processor for producing TX data..." without describing "TX" in plain text. (when an acronym appears for the first time in one of the claims, it needs to be described in the claim itself). Examiner believes that it should be "transmit or transmitting" and use this assumption in the office action below.

Also in claim 4 acronyms "FSQ and QPSK" are used with no explanation. Furthermore "FSQ" seems like a typographical error, it should be changed to FSK, examiner interpret it as FSK in the office action below.

Furthermore, in the independent Claims 11 and 19 the Applicant used the above discussed Acronyms with out describing in the plain text as required.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 1 and 15 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The last limitation in claim 1, "phase-locked loop circuitry for up-converting the analog I and Q channel signals from a baseband frequency to a specified RF channel." is not enabled by specification, as the Applicant has not described a "PLL or phase locked loop" any where in the specification and drawings.

Claim 15 has limitation "radio transmitter initially transmits in an FSK modulation mode of operation and, while in the FSK modulation mode, transmits ID information in the FSK modulation mode." However, the specification doesn't enable this limitation i.e. the Applicant has not described a "transmits ID information" any where in the specification.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1-3, 8-14, and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schwartz et al. (US Patent no. 5,945,885) in view of Yang et al. (US patent no. 7,173,982) and further in view of Balasubramaniyan et al. (US patent no. 7,209,720).

Regarding claims 1,11-14, and 19-20:

Schwartz et al discloses a radio transmitter for producing phase-shift keyed (PSK) and frequency-shift keyed (FSK) modulated communication signals (column 6, lines 40-46), comprising:

- baseband processor for producing TX (transmitter or transmit) data (data input in figure 1) and a TX control signal (column 4, lines 33-36);
- a digital modulator (10 in figure 1; figure 5), that receives TX data, that digitally modulates outgoing digital data to produce one of an FSK or PSK modulated digital information signal based upon the TX control signal wherein the digital modulator further includes:

  modulation switching control block that receives the TX control signal, producing a modulation control signal to select one of a plurality of types of modulation data ("the modulation format control, and selected modulation type is interpreted as modulation control signal", column 4, lines 34-36), the modulation switching control block also producing a multiplexer (mux) control signal to couple one of the plurality of types of modulation data to a mux output (column 5, lines 56-60);

  pulse shaping block (50 in figure 2, 102 in figure 5; figure 6) for producing FSK phase information based upon a first value of the modulation control signal, which FSK phase information consists of one of a logic zero or a phase value for a FSK modulated signal based upon the TX data, the pulse shaping block further producing I and Q modulated data based upon the TX data for a second value of the pulse modulation control signal (column 7, lines 14-19; "the modulation format control, and selected modulation type is interpreted as modulation control signal" column 4, lines 34-36, and column 5, lines 56-60 respectively)

Mux block (60 in figure 4) coupled to receive the I and Q modulated data at a first input pair and further coupled to receive a logic one and a logic zero at a second input pair, the Mux block producing the I and Q modulated data received at the first input pair based upon a first value of the Mux control signal and for producing the logic one and logic zero received at the second input pair based a second value of the Mux control signal (column 5, lines15-27);

phase accumulator (118 in figure 5) coupled to receive the FSK phase information, the phase accumulator producing an accumulated phase value (column 6, lines 47-50, and 64-65);

an interpolation filter producing up-sampled I and Q channel data characterized by an output sample rate based upon an input sample rate of the compensated I and Q channel signals (columns 7-8; lines 62-67, and 1-12 respectively);

- digital to analog converter circuits (110, 112 in figure 5) for converting the up-sampled I and Q channel data to analog I and Q channel signals having a continuous waveform;
- filtering circuits (114, 116 in figure 5) for filtering the analog I and Q channel signals.

Schwartz et al discloses all of the subject matter as described above, and further discloses a polar to rectangular converter (122 in figure 5) receives accumulated phase information and produces I and q signals (column 6; lines 54-

64; produces outputs in one of three states based upon the FSK phase information and upon the I and Q modulated data i.e. for a first state, the I and Q channel signals characterized by a phase reflecting the FSK phase information; for a second state, I and Q channel signals having a phase and a magnitude based upon the I and Q modulated data and further based upon the FSK phase information; and for a third state, I and Q channel signals having a phase and a magnitude based upon the I and Q modulated data) except for specifically teaching;

a Coordinate Rotation Digital Computer (CORDIC; i.e. the polar to rectangular converter is a CORDIC) block coupled to receive the accumulated phase value and further coupled to receive the I and Q modulated data; and

a DC offset compensation block coupled to receive the I and Q channel signals, the DC offset compensation block for pre-compensating for expected downstream low frequency interference, the DC offset compensation block producing compensated I and Q channel signals; and

phase-locked loop circuitry for up-converting the analog I and Q channel signals from a baseband frequency to a specified RF channel.

However, Yang et al, in the same field of endeavor, teaches Coordinate Rotation Digital Computer (CORDIC) block coupled to receive the accumulated phase value and further coupled to receive the I and Q modulated data, the ' CORDIC block producing I and Q channel signals reflecting a phase and

magnitude based upon the accumulated phase value and the I and Q modulated data (column 2; lines 42-64; figures 3-4); and

a DC offset compensation block coupled to receive the I and Q channel signals, the DC offset compensation block for pre-compensating for expected downstream low frequency interference, the DC offset compensation block producing compensated I and Q channel signals (26 in figure 4; column 6, lines 14-25).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to implement the rectangular converter as taught by Schwartz et al in the form of Coordinate Rotation Digital Computer (CORDIC) as it is a simple and efficient algorityhm to calculate hyperbolic and trigonometric functions, and to use a DC offset compensation as taught by Yang et al in Schwartz system to remove the DC offset present in the signal in order to compensate for expected downstream low frequency interference.

Balasubramaniyan et al, in the same field of endeavor, teaches phase-locked loop circuitry for up-converting the analog I and Q channel signals from a baseband frequency to a specified RF channel (column 3, lines 55-64).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to use the PLL as taught by Balasubramaniyan et al for up-converting the analog I and Q channel signals. The PLL circuit has the advantage that it produces the output at a required frequency (band) by raising or

lowering the frequency of the oscillator while recovering the signal from noisy channel.

Regarding claim 2:

Schwartz et al discloses all of the subject matter as described above, and further discloses a requantizer within the digital modulator for reducing granularity of up-sampled I and Q channel data prior to the up-sampled I and Q channel data being converted to analog I and Q channel signals (108 in figure 5; column 6, lines 16-20, the resampler 108 also changes the granularity).

Regarding claim 3:

Schwartz et al discloses all of the subject matter as described above, and further discloses a transmit data is produced by the baseband processor at one of a plurality of data rates and wherein the baseband processor produces the control signal to select one a plurality of corresponding modulation types (column2; lines 35-42; input data is coming at one of the data rates; chosen modulation type is interpreted as control signal).

Regarding claim 8:

Schwartz et al discloses all of the subject matter as described above, and further discloses a pulse shaping block of the digital modulator further includes an FSK symbol

mapper and a PSK symbol mapper, each of which is coupled to receive the TX data (204 and 208 in figure 6; column 7, lines 15-30).

Regarding claim 9:

Schwartz et al discloses all of the subject matter as described above, and further discloses that FSK and PSK symbol mappers produce FSK phase data and constellation data, respectively, to a filter bank that, based upon the modulation control signal selects a corresponding filter of a plurality of filters (figures 2, 5-8; column 7, lines 33-35; column 8, lines 35-45).

Regarding claim 10:

Schwartz et al discloses all of the subject matter as described above, and further discloses a filtering means for filtering FSK and PSK symbols according to the modulation control signal (52, 54 in figure 2; column 4, lines 62-67).

7. Claims 4-6, and 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schwartz et al. (US Patent no. 5,945,885) in view of Yang et al. (US patent no. 7,173,982) as applied to claims 1, 3, and 11 above, and further in view of Zehavi (US Patent no. 6,928,123).

Regarding claim 4:

Schwartz et al discloses all of the subject matter as described above except for explicitly teaching the plurality of data rates comprise rates of 1MHz and 2Mhz and corresponding modulation types of FSK and QPSK.

However, Zehavi in the same field of endeavor teaches different data rates corresponding to modulation types of FSK and QPSK, also furthermore it is well known in the art that according to standards of IEEE the QPSK data rate is more than FSK.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to use different data rates including 1MHz and 2Mhz corresponding to modulation types of FSK and QPSK in order to switch to a modulation mode with higher data rate to keep the system compatible with the new techniques using higher data rates.

Regarding claim 5:

Schwartz et al discloses all of the subject matter as described above except for explicitly teaching using a data rate of 3 MHz and a corresponding modulation technique of 8-PSK.

However, Zehavi in the same field of endeavor teaches different data rates corresponding to modulation types of FSK, QPSK, and 8-PSK, also furthermore it is well known in the art that according to standards the 8-PSK data rate can be 3MHz.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to use data rate of 3MHz corresponding to modulation types of 8-PSK

in order to switch to a modulation mode with higher data rate to keep the system compatible with the new techniques using higher data rates.

Regarding claim 6:

Schwartz et al discloses all of the subject matter as described above except for explicitly teaching baseband processor is operating according to a legacy Bluetooth protocol.

However, Zehavi in the same field of endeavor teaches baseband processor operating according to a legacy Bluetooth protocol (column 1, lines 16-21 i.e. communication devices using Bluetooth protocol).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to keep the device operable according to legacy Bluetooth protocol in order to provide improved devices for high speed data communication while maintaining downward compatibility.

Regarding claim 15:

Schwartz et al discloses all of the subject matter as described above except for explicitly teaching the radio transmitter initially transmits in an FSK modulation mode of operation and, while in the FSK modulation mode, transmits ID information in the FSK modulation mode.

However, Zehavi in the same field of endeavor teaches radio transmitter determines that a remote communication device is capable of higher data rate PSK

modulation mode communications and then switch to higher data rate communication (column 2, lines 4-8).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to configure the radio transmitter initially transmits in an FSK modulation mode of operation and, while in the FSK modulation mode, transmits ID information in the FSK modulation mode to check with the receiving device is capable of higher data rate to take advantage of high speed transmission.

Regarding claim 16:

Schwartz et al discloses all of the subject matter as described above except for explicitly teaching radio transmitter determines that a remote communication device with which the radio transmitter is communicating is capable of higher data rate PSK modulation mode communications.

However, Zehavi in the same field of endeavor teaches radio transmitter determines that a remote communication device with which the radio transmitter is communicating is capable of higher data rate PSK modulation mode communications (column 2, lines 4-8).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to get the transmitter determines that a remote communication device with which transmitter is communicating is capable of higher data rate communications in order to make sure a reliable communication with out data loss.

Regarding claim 17:

Schwartz et al discloses all of the subject matter as described above except for explicitly teaching radio transmitter transitions to the higher data rate PSK modulation mode communications during a transition period and, after the transition period, communicates in the higher data rate PSK modulation mode communications.

However, Zehavi in the same field of endeavor teaches radio transmitter transitions to the higher data rate PSK modulation mode communications during a transition period and, after the transition period, communicates in the higher data rate PSK modulation mode communication (column 1, lines 20-25; column 2, lines 4-8).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to get the radio transmitter transitions to the higher data rate PSK modulation mode communications during a transition period and, after the transition period, communicates in the higher data rate if the device is able to communicate at higher data rate to take advantage of the high speed data transfer.

8. Claims 7, and 18 rejected under 35 U.S.C. 103(a) as being unpatentable over Schwartz et al. (US Patent no. 5,945,885) in view of Yang et al. (US patent no. 7,173,982) as applied to claim 1, 11, and 15-17 above, and further in view of Khoini-Poorfard (US Patent no. 6,865,235).

Regarding claims 7, and 18:

Schwartz et al discloses all of the subject matter as described above, and further discloses using different data rates including 1MHz and 2Mhz corresponding to modulation types of FSK and QPSK except for explicitly teaching data rate of 1 Mbps which 1 Mbps TX data is FSK modulated and wherein the radio transmitter increases the data rate to at least a 2 Mbps data rate, which increased data rate is transitioned from the FSK modulation to a PSK modulation without spectral mask violation

However, Khoini-Poorfard in the same field of endeavor teaches switching between modulation modes without spectral mask violation (column 6, lines 30-42).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to use the different modulation modes and switching continuously between higher and lower data rate modulation techniques with out spectral mask violation i.e. without going to frequencies outside the bandwidth in order to make the transition between modulation modes smooth.

9. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schwartz et al. (US Patent no. 5,945,885) in view of Zehavi (US Patent no. 6,928,123) and further in view Khoini-Poorfard (US Patent no. 6,865,235).

Regarding claim 21:

Schwartz et al discloses a radio transmitter for producing phase-shift keyed (PSK) and frequency-shift keyed (FSK) modulated communication signals (column 6, lines 40-46; figure 5) in a first communication mode, transmitting communication signals

with a remote agent according utilizing a first modulation technique at a first data rate (column 1, lines 22-26) except for explicitly teaching;

determining that the remote agent is capable of communicating using a modulation technique at a second data rate;

in a transition mode, transmitting communication signals with the remote agent according to the first and second modulation techniques at the second data rate during a transition period;

in a second communication mode, transmitting communication signals with the remote agent solely utilizing the second modulation technique at the second data rate;

during the first and second communication modes and transmitting within a spectral mask without spectral leakage.

However, Zehavi in the same field of endeavor teaches radio transmitter determines that a remote communication device with which the radio transmitter is communicating is capable of higher data rate PSK modulation mode communications (column 2, lines 4-8). Also teaches radio transmitter transitions to the higher data rate PSK modulation mode communications during a transition period and, after the transition period, communicates in the higher data rate PSK modulation mode communication (column 1, lines 20-25; column 2, lines 4-8).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to get the transmitter determines that a remote communication device with which transmitter is communicating is capable of higher data rate communications in order to make sure a reliable communication with out data loss, and to get the radio

transmitter transitions to the higher data rate PSK modulation mode communications during a transition period and, after the transition period, communicates in the higher data rate if the device is able to communicate at higher data rate to take advantage of the high speed data transfer.

Also, Khoini-Poorfard in the same field of endeavor teaches switching between modulation modes without spectral mask violation (column 6, lines 30-42).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to use the different modulation modes and switching continuously between higher and lower data rate modulation techniques with out spectral mask violation i.e. without going to frequencies outside the bandwidth in order to make the transition between modulation modes smooth.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a. Batra et al. (US Publication no. 2004/0218683) teaches a transmitter transmitting with one of multiple selectable modulation techniques supported by target device.

b. Cochran et al. (US Patent no. 5,440,265) teaches using a CORDIC conversion process using phase and magnitude of the signal.

c. Ishigaki (US Patent no. 5,832,027) teaches a spread spectrum modulation apparatus providing FSK and PSK communication.

d. Balasubramaniyan et al. (US Patent no. 7,209,720) teaches using a multiband and multimode transmitter.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hirdepal Singh whose telephone number is 571-270-1688. The examiner can normally be reached on Mon-Fri (Alternate Friday Off)8:00AM-5:00PMEST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shuwang Liu can be reached on 571-272-3036. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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SUPERVISORY PATENT EXAMINER

HS
July 12, 2007

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